

Listing of Claims:

Claim 1 (previously presented): A device for performing surgery or therapeutic interventions on a patient, comprising:

a first non-invasive curvature sensor configured to be placed externally on a patient, the first non-invasive curvature sensor providing first external curvature data;

imageable fiducials coupled to the first non-invasive curvature sensor;

and

an attachment fixture coupled to the first non-invasive curvature sensor;

and

a computer configured to receive the first external curvature data and relate the curvature of the first non-invasive curvature sensor to the location of the imageable fiducials; and a 3-D internal image set of the patient.

Claim 2 (Cancelled)

Claim 3 (previously presented): The device of claim 1, further comprising:

a second non-invasive curvature sensor providing second external curvature data, the second non-invasive curvature sensor having a first end and a second end and capable of being coupled to the attachment fixture at the first end; and

a tool connector coupled to the second end of the second non-invasive

curvature sensor.

Claim 4 (previously presented): The device of claim 3, further comprising a second attachment fixture capable of being positioned at a known location with respect to the first non-invasive curvature sensor, wherein the second end of the second non-invasive curvature sensor is coupled to the second attachment fixture and the tool connector is coupled to the second non-invasive curvature sensor between the first end and the second end.

Claim 5 (original): The device of claim 3, further comprising a monitor for positionally displaying the tool connector with respect to the patient.

Claim 6 (cancelled)

Claim 7 (original): The device of claim 3, further comprising an optical tracking system electronically coupled to the computer and configured to positionally track the tool connector or a tool positioned in the tool connector.

Claim 8 (previously presented): The device of claim 7, wherein the computer uses both the second non-invasive curvature sensor and the optical tracking system to positionally track the tool connector or a tool positioned in the tool connector.

Claim 9 (previously presented): The device of claim 1, wherein the computer is configured to determine an attachment fixture-centered frame of reference based on the first external curvature data.

Claim 10 (previously presented): The device of claim 1, wherein the first non-invasive curvature sensor comprises a fiber optic curvature sensor.

Claim 11 (previously presented): The device of claim 1, wherein the attachment fixture comprises:
at least one imageable fiducial; and
a latching mechanism configured for attaching to the first end of the non-invasive second curvature sensor.

Claim 12 (previously presented): A device for performing surgery or therapeutic intervention on a patient, comprising:
an attachment fixture;
at least one imageable fiducial coupled to the attachment fixture, the imageable fiducial being capable of being detected by a medical imaging system;
a non-invasive curvature sensor having a first end and a second end and capable of being coupled to the attachment fixture at the first end, the non-invasive curvature sensor configured to be placed externally on a patient, the non-invasive curvature sensor configured to provide external curvature data ;

a tool connector coupled to the second end of the non-invasive curvature sensor; and

a computer configured to receive the external curvature data and relate the curvature of the first non-invasive curvature sensor to the location of the imageable fiducials; and a 3-D internal image set of the patient.

Claim 13 (previously presented): A device for use in an image guided therapy or image guided surgery system, comprising:

a non-invasive curvature sensor configured to be applied externally to a portion of a patient, the non-invasive curvature sensor being adapted to measure and provide external curvature data;

imageable fiducials located on the non-invasive curvature sensor;

an attachment fixture coupled to the non-invasive curvature sensor, the attachment fixture comprising an imageable fiducial; and

a computer configured to receive the external curvature data and relate the curvature of the non-invasive curvature sensor to the location of the imageable fiducials; and a 3-D internal image set of the patient.

Claim 14 (cancelled)

Claim 15 (previously presented): The device for use in an image guided therapy or image guided surgery system according to claim 13, wherein the non-invasive curvature sensor comprises a fiber optic curvature sensor.

Claim 16 (previously presented): A device for generating a patient based frame of reference for an image guided therapy or image guided surgery system, comprising:

a non-invasive curvature sensor configured to be applied externally to a portion of a patient, the non-invasive curvature sensor being adapted to measure and provide external curvature data of the curvature of the portion of the patient;

imageable fiducials coupled to the non-invasive curvature sensor; and

an attachment fixture coupled to the non-invasive curvature sensor at a known position with respect to the non-invasive curvature sensor; and

a computer configured to receive the external curvature data and relate the curvature of the non-invasive curvature sensor to the location of the imageable fiducials; and a 3-D internal image set of the patient.

Claim 17 (previously presented): A device for generating a patient-based frame of reference for an image guided therapy or image guided surgery system according to claim 16, wherein each of the imageable fiducials are coupled to the non-invasive curvature sensor at known inter-fiducial distances.

Claim 18 – 25 (cancelled)

Claim 26 (previously presented): A system for monitoring or enabling surgery on

a patient at a distance, comprising:

a first non-invasive curvature sensor configured to be placed externally on the patient, the first non-invasive curvature sensor providing first external curvature data;

imageable fiducials coupled to the first non-invasive curvature sensor;

an attachment fixture attached to the first non-invasive curvature sensor;

a second non-invasive curvature sensor having a first end and a second end and capable of being coupled at the first end to the attachment fixture, the second non-invasive curvature sensor providing second external curvature data;

a tool capable of being coupled to the second end of the second non-invasive curvature sensor; and

a computer configured to:

receive the first external curvature data;

receive the second external curvature data;

relate the curvature of the first non-invasive curvature sensor to the location of the imageable fiducials; and a 3-D internal image set of the patient;

provide an output of the curvature of the first non-invasive curvature sensor and the position and orientation of the tool coupled to the second end of the second non-invasive curvature sensor with respect to the attachment fixture; and

communicate the output of the computer to a distant receiver

using a communication device that is electronically coupled to the
computer.

Claim 27 – 30 (cancelled)

Claim 31 (currently amended): A device for conducting surgery or therapy on a
body, comprising:

means for externally measuring the curvature of a body;

means for locating the position of the means for externally measuring the
curvature of a body within a frame of reference;

means for determining the position of a tool with respect to the means
for externally measuring the curvature of a body; and

means for registering a [[a]] 3-D internal image set of the body to the
means for externally measuring the curvature of a body.